

REMARKS/ARGUMENTS

Status

Claims 1-8 are under examination.

Interview

Applicant thanks Examiner Bogart for the courtesy of a telephonic interview with the undersigned Applicant's representative on March 20, 2008. Claims of the instant application and of co-pending application number 10/756,849 were discussed.

Rejections Under 35 USC 103(a)

The present application is directed to paper diaper made using paper mulch comprising fibers (*e.g.*, cellulosic fibers) coated with an anti-bacterial and anti-fungal, water-insoluble, dark-brown form of copper oxide directly bound to the fibers. As explained previously the dark brown form of copper oxide comprises cuprous oxide and cupric oxide molecules covalently associated with the fiber (*see, e.g.*, amendment filed September 20, 2006). In one embodiment the fibers are disposed in the diaper as randomly scattered fibers in a paper layer.

All of the claims were rejected as allegedly obvious in view of the combination of four references:

- (1) Weinberg, U.S. Pat. No. 5,856,248 ("the Weinberg patent")
- (2) Gabbay, U.S. Pat. No. 6,124,221 ("the '221 patent")
- (3) Gabbay WO 01/741166 ("the '166 publication")
- (4) Gabbay, WO 01/81671 ("the '671 publication")

The Weinberg Patent

The Weinberg patent is cited as teaching a disposable paper diaper comprising a plurality of fibers coated with an anti-bacterial form of copper which fibers release cupric ions in cationinic form when in contact with a fluid. (Office Action page 3).

The '221 and '671 publications

The '221 patent is cited by the Office as teaching undergarments made of natural textile fibers having a plating that releases an antifungal amount of at least one oxidant cationic species of copper. Office Action at page 3. The '671 publication is cited as describing bonding of cupric oxide or cuprous oxide to a natural fiber textile fabric. Office Action at page 3. Neither the '221 patent nor the '671 publication describes paper products comprising fibers (which may be randomly scattered in a paper layer) having copper oxide directly bound to surface of the fibers.

The '166 publication

The '166 publication describes polymers (e.g., polypropylene) formed into fibers in which *micron-dimension* copper oxide *particles* containing cupric oxide and cuprous oxide partly protrude from the surface of the fiber. The '166 publication did not describe paper products in which copper oxide was directly bound to cellulose fibers.

The Office asserts

"it would have been obvious . . . to substitute the soluble salts of Weinberg with the directly plated cationic copper methods of the '221 [and] '671 [references] and the specific cationic species mixture of [the] '166 [reference] in order to provide an art recognized effective antimicrobial compound that avoids the problems associated with indirect bonding via carriers or adhesives . . . " (Office Action page 4).

The assertion that the salts of the '248 patent would be substituted by the copper methods of the remaining references is somewhat unclear. The methods of the Weinberg patent and the '221/'671 references are wholly different. The Weinberg patent describes a process in which cellulose fibers are chemically modified by a first stage treatment with a water soluble salt of a transition metal (e.g., copper sulfate) and an alkali (e.g., sodium hydroxide). This results in a light blue fiber having copper cations (presumably in the form of copper hydroxide) associated with cellulose by ionic bonds (col. 3, lines 18-22). In the second stage the fiber is treated with a

solution of a bisbiguanide compound such as chlorhexidine. The chlorhexidine is bound to copper by coordinative bonds thereby forming a bond between the fibers, the copper metal and bisbiguanide. The process results in a cellulose-copper-bisbiguanide compound complex attached to cellulose (column 3, lines 45-54). In *contrast* the '221/'671 references describe a plating process in which fibers are activated with catalytic palladium nucleation sites and copper oxide forms on the cellulose surface with (at least some) of the oxygen moiety contributed by the cellulose fibers (see Amendment filed September 20, 2006). Thus, it is not clear how or why the method of the '221/'671 references should be applied to any teaching of the Weinberg patent. The Office correctly notes that "the simple substitution of one known element for another" does not evidence patentability (Office Action, page 4). However, this is not a case in which one element is replaced by a different, functionally equivalent element. This is a case in which two wholly unrelated methods use different chemical agents (compare palladium and bisbiguanide, for example) produce completely different products (compare a cellulose-copper-bisbiguanide compound associated with cellulose and copper oxide molecules directly bound to cellulose, for example).

Moreover, although the Office argues the '671 reference provided motivation to avoid the problems associated with indirect bonding via carriers or adhesives, the carriers and adhesives referred to in the '671 reference are neither used in, nor comparable to the methods described in, the Weinberg patent. The '671 reference provides no motivation to modify Weinberg, and certainly no reference or combination of references cited by the Office provides any motivation to modify Weinberg along the lines hypothesized by the Office.

Although the Weinberg patent suggested that the copper-bisbiguanide compound method may be used to treat paper, this did not suggest that entirely different methods described in the '221 reference could be used to produce a paper product containing fibers coated with copper oxide directly bound to the fibers. Indeed, as discussed in the instant application and noted in prior responses by the Applicant, the conventional paper production process is incompatible with the copper plating process described in the '221/'671 references (see, *e.g.*, the instant

specification at page 6, line 23 to page 7, line 1 and the amendment filed September 20, 2006 at pages 7-8). The application of the wholly different Weinberg process does not suggest the present invention.

Further, the Weinberg product and the claimed invention differ in other ways. As stated in the instant specification, it was discovered that a fiber prepared with a plating of a cationic species of copper could be added to paper mulch in the final stages of production to provide an effective level of biocidal and fungicidal activity without interfering with the proper production of paper, and that it was advantageous to finely chop the fibers before adding them to the mulch. See the specification at, e.g., page 6, line 23 to page 7, line 12. This results in the claimed product, in which a paper portion comprising copper coated fibers (which may be disposed in said diaper as randomly scattered fibers in a paper layer; see claim 3). In contrast, the '248 process appears to result in fabrics and products uniformly coated with the copper-bisbiguanide compound complex.¹ Thus, it would *not* have been obvious to one of ordinary skill to make a paper diaper comprising a portion formed from paper mulch, with the portion comprising a plurality of fibers coated with an anti-bacterial and anti-fungal, water-insoluble, dark-brown form of copper oxide directly bound to the fibers, which fibers have been added to said paper mulch and which fibers release Cu⁺⁺ ions when in contact with a fluid.

Concerning the arguments of the Office at page 5, the Office correctly notes that product-by-process claims are not limited to the manipulations of the recited steps, but instead by the structure implied by the steps. However, this rule is improperly applied to claim 8, which is a method claim, not a product claim, and Applicants assume claim 7 was intended by the Office. The liner of claim 7 is novel and non-obvious for reasons discussed above. The Office asserts "Weinberg teaches cellulosic fibers which are substantially the same as those made according to

¹ The Office indicated the '248 patent at col. 2, line 49 to col. 3, line 62 described elements of claim 3. However, the '248 patent does not describe or suggest coated fibers disposed in a diaper as randomly scattered fibers in a paper layer.

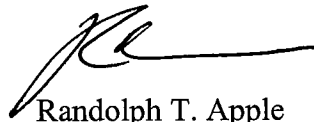
the claims." Insofar as Weinberg describes a wholly different product (textiles or paper uniformly coated with a copper-bisbiquanide complex rather than paper comprising fibers coated with a water-insoluble, dark-brown form of copper oxide directly bound to the fibers) Applicants disagree.

For all these reasons, Applicants respectfully submit no *prima facie* obviousness has been established. In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

CONCLUSION

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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